

Winfried BARCHET, PhD

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Current position

W2 Professor for Translational Immunology of the German Centre of Infection Research (DZIF), Institute of Clinical Chemistry and Clinical Pharmacology

Research expertise

The Barchet group focuses on the innate immune sensing of nucleic acids in scenarios ranging from pathogen infection, to cellular distress and autoinflammation. We study how and when distinct immune active structures are generated, gain access to receptors and are disposed of; and what mechanisms regulate the sensitivity of nucleic acid sensing pathways in sentinel cell-types, with the ultimate goal of informing appropriate immune therapeutic interventions.

Academic qualifications

- 2002 Doctorate, Dr. rer. nat. "mit Auszeichnung" (with honors), Biology, University of Cologne, Germany
- 1998 Diploma Degree, Dipl. Natw. ETH "mit Auszeichnung" (with honors)
- 1995 - 1998 Biochemistry, Eidgenössische Technische Hochschule (ETH) Zürich, Switzerland
- 1993 - 1995 Biochemistry, Freie Universität Berlin, Germany

Postgraduate professional career

- 2014 - pres. Appointment as full Professor (W2) for Translational Immunology, University of Bonn
- 2006 - 2014 Research group leader, Institute of Clinical Chemistry and Clinical Pharmacology, University of Bonn, Germany;
- 2008 - 2013 Emmy Noether Research Group Leader
- 2002 - 2006 Research associate, Department of Pathology and Immunology, Washington University in St. Louis, USA (Prof. Dr. Marco Colonna)
- 1998 - 2002 European Molecular Biology Laboratory (EMBL), Monterotondo, Italy

Honors and awards

- 2008 BONFOR research award (junior research group)
- 1998 - 2002 EMBL predoctoral fellowship
- 1996 - 1997 Joint scholarship by the DAAD and the ETH-Zürich

Memberships and professional functions

Memberships: German Society of Immunology (DGfI), Oligonucleotide Therapeutics Society (OTS)

Most important funding since 2012

- 2016 - 2020 DZIF TTU "Novel Anti-Infectives"
- 2016 - 2020 DFG IRTG 2168 "Myeloid antigen pres.ing cells and the induction of adaptive immunity"
- 2014 - 2018 DFG SFB 670 "Cell-autonomous Immunity"
- 2014 - 2017 DFG SFB 704 "Molecular Mechanisms and Chemical Modulation of Local Immune Regulation"
- 2014 - 2017 ImmunoSensation Cluster of Excellence, Member

Patents (issued)

- 2015. Sting crystals and modulators, EP3027227A1, US20160210400
- 2014 Compositions and methods for altering second messenger signaling, EP2991655A1
- 2010 TLR7 ligand and uses thereof, EP2408918A1, US20110250175

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Publications

1. Junt, T., and **Barchet, W.** (2015). Translating nucleic acid-sensing pathways into therapies. *Nat Rev Immunol* 15, 529-544.
2. Goubau, D., Schlee, M., Deddouche, S., Puijssers, A.J., Zillinger, T., Goldeck, M., Schuberth, C., Van der Veen, A.G., Fujimura, T., Rehwinkel, J., Iskarpatyoti, J.A., **Barchet, W.**, Ludwig, J., Dermody, T.S., Hartmann, G., and Reis e Sousa, C. (2014). Antiviral immunity via RIG-I-mediated recognition of RNA bearing 5'-diphosphates. *Nature* 514, 372-375.
3. Liehl, P., Zuzarte-Luis, V., Chan, J., Zillinger, T., Baptista, F., Carapau, D., Konert, M., Hanson, K.K., Carret, C., Lassnig, C., Muller, M., Kalinke, U., Saeed, M., Chora, A.F., Golenbock, D.T., Strobl, B., Prudencio, M., Coelho, L.P., Kappe, S.H., Superti-Furga, G., Pichlmair, A., Vigario, A.M., Rice, C.M., Fitzgerald, K.A., **Barchet, W.**, and Mota, M.M. (2014). Host-cell sensors for Plasmodium activate innate immunity against liver-stage infection. *Nat Med* 20, 47-53.
4. Gao, P., Ascano, M., Wu, Y., **Barchet, W.**, Gaffney, B.L., Zillinger, T., Serganov, A.A., Liu, Y., Jones, R.A., Hartmann, G., Tuschl, T., and Patel, D.J. (2013a). Cyclic [G(2',5')pA(3',5')p] is the metazoan second messenger produced by DNA-activated cyclic GMP-AMP synthase. *Cell* 153, 1094-1107.
5. Gehrke, N., Mertens, C., Zillinger, T., Wenzel, J., Bald, T., Zahn, S., Tuting, T., Hartmann, G., and **Barchet, W.** (2013). Oxidative damage of DNA confers resistance to cytosolic nuclease TREX1 degradation and potentiates STING-dependent immune sensing. *Immunity* 39, 482-495.
6. Gao, P., Ascano, M., Zillinger, T., Wang, W., Dai, P., Serganov, A.A., Gaffney, B.L., Shuman, S., Jones, R.A., Deng, L., Hartmann, G., **Barchet, W.**, Tuschl, T., and Patel, D.J. (2013b). Structure-function analysis of STING activation by c[G(2',5')pA(3',5')p] and targeting by antiviral DMXAA. *Cell* 154, 748-762. °equal contribution
7. Kubler, K., Gehrke, N., Riemann, S., Bohnert, V., Zillinger, T., Hartmann, E., Polcher, M., Rudlowski, C., Kuhn, W., Hartmann, G., and **Barchet, W.** (2010). Targeted activation of RNA helicase retinoic acid-inducible gene-1 induces proimmunogenic apoptosis of human ovarian cancer cells. *Cancer Res* 70, 5293-5304.
8. Gitlin, L., °, **Barchet, W.**, Gilfillan, S., Cella, M., Beutler, B., Flavell, R.A., Diamond, M.S., and Colonna, M. (2006). Essential role of mda-5 in type I IFN responses to polyriboinosinic:polyribocytidylic acid and encephalomyocarditis picornavirus. *Proc Natl Acad Sci U S A* 103, 8459-8464. °equal contribution
9. Krug, A., French, A.R., **Barchet, W.**, Fischer, J.A., Dzionek, A., Pingel, J.T., Orihuela, M.M., Akira, S., Yokoyama, W.M., and Colonna, M. (2004). TLR9-dependent recognition of MCMV by IPC and DC generates coordinated cytokine responses that activate antiviral NK cell function. *Immunity* 21, 107-119.
10. **Barchet, W.**, Cella, M., Odermatt, B., Asselin-Paturel, C., Colonna, M., and Kalinke, U. (2002). Virus-induced interferon alpha production by a dendritic cell subset in the absence of feedback signaling in vivo. *J Exp Med* 195, 507-516